

What is claimed is:

1. A thin film magnetic head comprising:
a slider having an air bearing surface opposite to a magnetic recording medium,
an inductive type thin film magnetic head including a first magnetic film having a first pole part of which the forefront surface is exposed to the air bearing surface and a first yoke part extending to the opposite side of the air bearing surface from the first pole part, a second magnetic film having a second pole part opposite to the first pole part of the first magnetic film via a gap film and extending to the opposite side of the air bearing surface from the second pole part to be connected to the first yoke part of the first magnetic film, a thin film coil wound so as to be capable of passing through the magnetic circuit surrounded by the first and the second magnetic films and supported by an insulated film, and a protective film to cover the first and second magnetic films, the gap film and the thin film coil, the inductive type thin film magnetic head being supported by the slider and constituting an inductive type thin film magnetic head element, wherein:

the forefront surface in the air bearing surface side of the second yoke part of the second magnetic film is recessed from the air bearing surface and the second pole part has a first step d1 in the running direction of magnetic recording medium and a second step d2 in the perpendicular direction to the running direction, and the protective film embeds the first and the second steps between the periphery of the forefront surface of the yoke forefront surface and the second pole part.

2. A thin film magnetic head as defined in claim 1, wherein the width of the second pole part in the perpendicular direction to the running direction of the magnetic recording medium is not more than 1 μm .

3. A thin film magnetic head as defined in claim 2, wherein the yoke

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forefront surface of the second yoke part is recessed from the air bearing surface by 0.1-1.5 μm , and the first steps d1 and the second steps d2 are 0.1-4 μm and 0.1-5 μm , respectively.

4. A thin film magnetic head as defined in claim 1, wherein the second magnetic film includes a main magnetic film and a subsidiary magnetic film, the main magnetic film being opposite to the insulated film, constituting the second pole part and extending to the opposite side of the air bearing surface to be connected to the first magnetic film, and the subsidiary magnetic film being opposite side to the opposing surface to the insulated film of the main magnetic film, constituting the yoke forefront surface.

5. A thin film magnetic head as defined in claim 1, wherein the first magnetic film has a plane surface thereof, on which the gap film is formed.

6. A thin film magnetic head as defined in claim 5, wherein the gap film is formed so as to almost cover the first magnetic film and the insulated film is provided on the gap film, and the yoke forefront surface rises up on the gap film in the forefront in the air bearing surface side of the insulated film.

7. A thin film magnetic head as defined in claim 5, wherein the gap film is formed so as to almost cover the first magnetic film and the insulated film is provided on the gap film, and the yoke forefront surface rises up on the gap film in the position near the air bearing surface side from the forefront in the air bearing surface of the insulated film.

8. A thin film magnetic head as defined in claim 1, wherein the part of the gap film around at least the one side of the first pole part of the first magnetic film is removed and the part of the first magnetic film is removed in its thickness, thereby to form a depressed portion to define the width of the first pole part.

9. A thin film magnetic head as defined in claim 8, wherein the depressed portion is formed in the both sides of the first pole part.

10. A thin film magnetic head as defined in claim 9, wherein the first pole part has a width almost equal to that of the second pole part as they are viewed from the air bearing surface.

11. A thin film magnetic head as defined in claim 1, further comprising a magnetoresistive effective element supported by the slider.

12. A thin film magnetic head as defined in claim 11, wherein the thin film magnetic head element and the magnetoresistive effective element are laminated each other.

13. A method for manufacturing a thin film magnetic head in which a first magnetic film, a gap film and a thin film coil supported by an insulated film are formed on a substrate to be a slider and thereafter a second magnetic film is formed, the step of forming the second magnetic film comprising the steps of:

forming a main magnetic film having a pole part opposite to the first magnetic film via the gap film and a yoke part connected to the first magnetic film backward in the opposite side of the pole part,

forming a pattern of resist around the main magnetic film so as to cover the pole part of the main magnetic film and leave a space between itself and the sides of the pole part in the area within the yoke part from the pole part, and

forming a subsidiary magnetic film in the area surrounded by the resist pattern.

14. A method for manufacturing a thin film magnetic head as defined in claim 13, wherein the subsidiary magnetic layer is formed in the area surrounded by the resist pattern by an electroplating method.

15. A method for manufacturing a thin film magnetic head as defined in claim 13, wherein the subsidiary magnetic layer is formed in the area surrounded by the resist pattern by a sputtering method.

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16. A method for manufacturing a thin film magnetic head as defined in claim 13, further comprising step of: partially removing the gap film and the first magnetic film in the both sides of the pole part in its width direction, thereby to form a depressed portion.

17. A method for manufacturing a thin film magnetic head as defined in claim 16, wherein the partial removing the gap film and the first magnetic film is carried out after the subsidiary magnetic film is formed.

18. A method for manufacturing a thin film magnetic head as defined in claim 16, wherein the partial removing the gap film and the first magnetic film is carried out before the subsidiary magnetic film is formed.

19. A method for manufacturing a thin film magnetic head as defined in claim 18, further comprising the step of: sticking a non-magnetic film at least on the exposed surface of the first magnetic film formed by partially removing the first magnetic film before the subsidiary magnetic film is formed after the gap film and the first magnetic film are partially removed.

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